

Family Physicians: Supply and Demand

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The paper is a revised excerpt of testimony presented by Dr. Bowman as the representative of the American Academy of Family Physicians to the Council on Graduate Medical Education, which has been considering the supply of and requirements for physicians. While the Academy supplied background information, this paper does not represent an official policy statement of the organization.

Synopsis.....

The nation's supply of family physicians as estimated by the Graduate Medical Education National Advisory Committee appears fairly accurate. At the same time, the demands for family physicians appear to be strong, partially because case-management systems recognize the cost-effectiveness and appropriate training of family physicians for their needs. The largest factor inhibiting the supply of such physicians appears to be the relatively lower income of family practice compared to other specialty fields. This creates more difficulties in funding training positions and may limit the attractiveness of the field to medical school graduates.

THE POOL OF FAMILY PHYSICIANS is an integral portion of the physician manpower supply in the United States, but it is changing in relative and absolute quantity and in character. In attempting to consider future needs, I will review past data and current major issues which may affect the supply and requirements for family physicians. Specifically, the impact of general practitioners, female physicians, and foreign medical graduates on supply will be considered. Two major factors limiting the supply, funding, and possibly the number of entering students, are presented. The Graduate Medical Education National Advisory Committee's estimates of the supply and requirements will be compared with known recent data and Health Maintenance Organization figures and projections of the American Academy of Family Physicians.

The major change in the character of the field of family medicine is the development of specific residency training programs for family practice in 1969, concurrent with the creation of the American Board of Family Practice, moving the field from general practice toward family practice. Overall, the impact of the development of these residency training programs has been to produce more family physicians with a uniform level of training, resulting in a clearer definition of family practice. Nevertheless, in many ways family physicians retain characteristics similar to those of the general practitioner; they still are more likely to locate in rural

and underserved areas than other physicians and to spend less time per patient than the average internist (1). They are less productive, however, in terms of numbers of patients seen than their nonresidency trained counterparts, which is an important determinant of health manpower needs (2,3).

In spite of differences between general practitioners and family physicians, any consideration of the supply of and requirements for family physicians is seriously hampered by the inability of most studies to differentiate between the two groups. Many studies rely on American Medical Association (AMA) data, which are based on self-declared specialty, rather than another measure. Board certification is not a good measure of the difference, since it does not clarify how a physician is trained or practices.

Since the development of residency training programs, the massive loss of physicians from the field of family or general practice has been stemmed, but it has not been entirely reversed. (See tables 1-4.) A substantial percentage of family or general practitioners are more than 55 years of age. As a percentage of total physicians, however, the number of family physicians has continued to fall, and will probably continue to do so for a number of years, although by an almost imperceptible amount. Residency graduates now account for about one-third of the total number of general or family physicians, by AMA statistics.

Table 1. Number of residents, graduates, and the percentage of fill rates in family practice programs

Accredited year programs ¹	First year residents ¹	Residents all years ¹	Graduates ¹	Fill rate ² (percent)	First year position fill rate ¹ (percent)	Total first year residents in family practice ³ (percent)
1969	15	...	...	...	...	...
1970	45	...	...	...	...	...
1971	62	...	...	...	...	...
1972	117	...	...	...	...	...
1973	164	762	4 525	...	...	...
1974	205	1,217	351	81	...	6.4
1975	250	1,616	567	85	...	...
1976	288	1,864	828	85	...	...
1977	325	2,043	1,190	81	...	10.0
1978	348	2,318	1,548	83	96	10.4
1979	364	2,360	1,724	80	94	...
1980	382	2,365	1,846	78	93	12.7
1981	386	2,489	2,072	78	96	12.3
1982	387	2,578	2,183	82	97	12.6
1983	388	2,545	2,133	81	97	12.5
1984	384	2,551	2,264	85	99	12.3
1985	378	2,527	2,362	80	99	12.2
1986	381	2,473	2,386	82	97	...
1987	382	2,456	2,458	83	94	...
1988	...	...	...	73	...	...

¹ From the American Academy of Family Physicians, Division of Education.² From the National Resident Matching Program, published in Journal of Medical Education.³ From JAMA's yearly issues on medical education.⁴ Cumulative through 1973.

Table 2. Federal and non-Federal physicians per 100,000 population in family and general practice for selected years, 1965-85

Specialty	1965	1970	1975	1980	1982	1985
Family practice	...	...	...	11.9	14.4	16.5
General practice	36.2	27.9	24.9	14.1	14.4	11.1
Family and general	36.2	27.9	24.9	26.0	28.8	27.6
Cumulative percent change	...	-23	-31	-28	-20	-24
All physicians	148.2	160.5	179.6	202.2	213.0	227.5
Cumulative percent change	...	+8	+21	+36	+43	+54

NOTE: adapted from "Physician Characteristics and Distribution in the U.S.," 1983 edition, American Medical Association.

Female Physicians, FMGs in Family Practice

Women and foreign medical graduates (FMGs) are two groups of physicians who are thought to affect significantly the supply and demand of family practitioners. Female physicians may do so by having lower productivity than male physicians (4), and foreign medical graduates do so by changes in the number who enter the United States in any one year. The number of female physicians in family practice has lagged behind overall averages but is slowly catching up (table 5). This trend means that the impact of female physicians on the requirements for family practitioners is conceivably less than that for other types of specialties.

The proportion of foreign medical graduates in family practice is also less than their proportion of

all physicians and will remain so indefinitely (table 6). This factor places family practice at less risk from major changes in the supply of foreign medical graduates than other specialties.

Funding Difficulties

Family practice has been one of the three lowest paid specialties. The income of family physicians has dropped in comparison to inflation in recent years, while incomes in many other specialties have increased (5). Overall, family physicians' income increased at about half the rate of inflation, while physicians' income in general increased at about the rate of inflation (5).

Less income affects the supply of family physicians in two ways. First, it makes training pro-

Table 3. Total Federal and non-Federal physicians by specialty for selected years, 1965–85

Specialty	1965	1970	1975	1980	1982	1985
Family practice .....	...	...	...	27,530	33,831	40,021
General practice	71,366	57,948	54,557	32,519	28,508	27,030
Family and general practice	71,366	57,948	54,557	60,049	62,339	67,051
Percent change .....	...	- 19	- 24	- 16	- 13	- 6
Family and general practice as percent of all MDs	24	17	14	13	12	12
All physicians	292,088	334,028	393,742	467,679	501,958	552,716
Cumulative percent change ....	...	+ 14	+ 35	+ 60	+ 72	+ 89

NOTE: adapted from "Physician Characteristics and Distribution in the U.S." 1983 edition, American Medical Association.

Table 4. Distribution by age in 1985 of family and general practice Federal and non-Federal physicians

Specialty	Under 35 years	35–44 years	45–54 years	55–64 years	65 years and older	Total
Family practice	15,631	11,760	5,041	5,195	2,394	40,021
General practice	1,219	3,344	5,227	8,372	8,888	27,030
Total family and general	16,850	15,104	10,268	13,567	11,262	67,051
Percent of total	25	23	15	20	17	100
All nonfamily or general practice	124,772	139,648	89,424	65,420	66,401	485,665
Percent of total	26	29	18	13	14	100
All physicians	141,622	154,752	99,692	78,987	77,663	552,716
Percent of total	26	28	18	14	14	100

NOTE: adapted from "Physician Characteristics and Distribution" 1986 edition, American Medical Association.

Table 5. Female physicians in family practice (percentages of all physicians)

Category	1970	1975	1980	1982	1985	1986
Female physicians	7.6	9.1	11.6	12.8	14.6	...
Female general or family physicians	3.5	5.3	7.8	9.7	11.9	...
Female residents .....	...	...	22.2	23.2	26.2	...
Female family practice residents .....	...	8.3	19.5	21.5	26.0	27.5

NOTE: adapted from "Physician Characteristics and Distribution in the U.S." 1983 edition, American Medical Association; 1981–1982 and 1984–1985 Directories of Residency Training Programs, American Medical Association; JAMA

Medical Education Issue, Sept. 26, 1986, vol. 256; and American Academy of Family Physicians data.

grams more difficult to fund, limiting the number of positions available, and second, it makes the field less attractive to potential practitioners.

The lower income is characteristic of primary and cognitive medical caregivers as compared with givers of procedural medical care. This difference results from a system of reimbursement, exemplified by Medicare, but followed by many other insurers. The system is inherently inflationary for less common procedures, static for very commonly performed current procedural terminology (CPT) codes, and rewards procedures more than cognition (5). Also, with recent fee freezes, small dollar items (such as the office visits provided by family physicians) have been inherently hurt compared with large dollar items (such as surgery). Code creep—charting under more codes for the same procedure

or advancing to a higher paying code for the same procedure—is also more readily possible for procedural than for cognitive services.

This price system means that clinical income cannot support as much of the training for family medicine as it can for other specialties. Family practice residencies are more dependent on Medicare Part B income than are other specialties (personal communication from Dr. Christian Ramsey, University of Oklahoma). Also, the best training for family medicine must be given in outpatient settings which are inherently more costly and less efficient.

Other ambulatory training programs have similar funding problems, which is one reason more such programs do not exist. To provide adequately for the primary care needs of the population in the future, this specific topic will need to be addressed

Table 6. Foreign medical graduates (FMG) in family practice (percentages of all physicians.)

Category	1970	1975	1980	1982	1985
FMG physicians	19.0	22.5	22.0	22.4	21.5
General or family FMG physicians	11.6	14.2	15.3	17.0	17.8
FMG residents .....	...	...	7.8	18.6	16.8
FMG family practice residents .....	...	...	6.2	11.7	12.9

NOTE: Adapted from "Physician Characteristics and Distribution in the U.S.," 1983 edition, American Medical Association; 1981-1982 and 1984-1985 Directo-

ries of Residency Training Programs, American Medical Association; and JAMA Medical Education Issue, Sept. 26, 1986, vol. 256.

adequately through reimbursement reform and probably through increasing Federal funds for this sector of graduate medical education. Another means of funding is to encourage those who benefit from the products of residency training—HMOs for example—to help support the training. There are isolated instances of this occurring.

The poorer funding of family medicine may also discourage potential candidates for the field. Medical school graduates with \$100,000 in debts will have more difficulty paying off their loans on a family physician's income than that of many surgical specialties. Conversely, however, the training for family practice is shorter than for most of the higher paying specialties, and some of the higher paying specialties must pay substantially higher premiums for malpractice insurance.

Declining Interest

There is at least one potential indicator of declining interest in the field of family practice. Although graduating U.S. medical students' rate of entry into family practice had dropped slightly from its peak, it seemed relatively stable until the 1988 National Resident Match Program (NRMP) which matches medical students with residency programs of their choice (table 1). The number of positions in family practice filled through the NRMP in 1988 was 1,768, a decrease from 1,978 the previous year. The 1988 fill rate was 73.3 percent, a drop from the formerly consistent rate of more than 80 percent. While the implication for future years cannot be foretold at this time, the decrease corresponds to an apparent decline in U.S. graduates' interest in other primary care fields, including internal medicine and pediatrics.

Present and Future Data

The most recent large study which considered the supply and demand of family physicians was that of the Graduate Medical Education National Advi-

sory Committee (GMENAC), published in 1980 (6).

GMENAC supply estimates. The supply estimates of the GMENAC were based on continuing the projected numbers of family practice residencies and using the branching and switching model that had been developed to determine the numbers of residents switching into and out of the specialty (table 7).

GMENAC predicted that a total of 64,000 family physicians, including 7,600 residents and fellows, would be practicing in 1990. With these projections, the ratio of general or family physicians to the population was projected to improve. According to estimates of the American Academy of Family Physicians (AAFP) (table 8, information courtesy of Claudine Clinton, Director, Division of Research and Information, AAFP), GMENAC overestimated the supply. On the basis of what has occurred, the Academy estimates that there will be 60,925 practicing family physicians and 7,453 residents in 1990. To make this number comparable to GMENAC estimates requires adding 2,108 active Federal physicians, for a total of 63,033. Thus, GMENAC overestimated practicing physicians by 2.2 percent and residents by 2.0 percent.

There are other primary care physicians. Ninety percent of osteopathic physicians are estimated to be in general practice. GMENAC's total supply estimate for the three adult primary care specialties of family or general practice, osteopathic general practice, and general internal medicine for 1990 is 162,050, or 1 per 1,500 people. If pediatrics and obstetrics, two other specialties sometimes considered to be primary care, are included, the 1990 estimate is 234,250, or 1 per 1,040 people. The total of nonprimary care physicians in 1990 would be 301,500, or 1 per 808 people.

GMENAC estimated family or general practitioners and general internists to be 30 percent of all primary and nonprimary care physicians. Adding pediatricians and obstetricians raises that percentage to 44.

The ratio of all physicians to population is 1 to 455.

Table 7. GMENAC estimates of physician supply and demand for family practice, general practice, and internal medicine

<i>Supply and demand</i>	<i>General family practice</i>	<i>Osteopathic physicians</i>	<i>General internal medicine</i>	<i>Total</i>
1978 supply	54,350	13,550	48,950	116,850
1990 supply	64,400	23,850	73,800	162,050
Percent increase	18	76	51	39
1978 phys:pop. ratio supply	1:4,000	1:16,000	1:4,500	1:1,871
1990 phys:pop. ratio supply	1:3,800	1:10,000	1:3,300	1:1,500
1990 demand	61,750	23,050	66,500	151,300
1990 phys:pop. ratio demand	1:3,944	1:10,564	1:3,662	1:1,609

Table 8. American Academy of Family Physicians projected supply of general or family physicians¹

<i>Year</i>	<i>Annual residency graduates²</i>	<i>Attrition³</i>	<i>Net year-end supply</i>	<i>Residents in training</i>	<i>Administration</i>
1987	2,415	1,842	59,573	7,270	1,013
1988	2,350	1,858	60,065	7,261	1,021
1989	2,300	1,879	60,486	7,396	1,028
1990	2,325	1,884	60,925	7,453	1,038
1991	2,340	1,899	61,398	7,522	1,044
1992	2,370	1,849	61,919	7,571	1,053
1993	2,390	1,865	62,444	7,609	1,062
1994	2,410	1,881	62,973	7,631	1,102
1995	2,420	1,831	63,562	7,657	1,112
1996	2,425	1,848	64,139	7,680	1,122
1997	2,430	1,864	64,705	7,710	1,132
1998	2,440	1,813	65,332	7,735	1,176
1999	2,465	1,831	65,996	7,765	1,187
2000	2,495	1,848	66,613	7,785	1,199
2001	2,500	1,866	67,252	7,810	1,211
2002	2,520	1,814	67,958	7,825	1,257
2003	2,525	1,833	68,650	7,840	1,270
2004	2,530	1,851	69,329	7,855	1,283
2005	2,535	1,868	69,996	7,870	1,295
2006	2,540	1,886	70,650	7,885	1,342
2007	2,545	1,903	71,292	7,900	1,355
2008	2,550	1,920	71,922	7,915	1,367
2009	2,555	1,846	72,631	7,930	1,380
2010	2,560	1,880	73,311	7,945	1,393

¹ Excludes physicians outside of 50 States.² Estimates of growth: Number of first year residency positions will start increasing in 1987-88. Fill rate of first-year positions at 97.5 percent; rising to 98 percent in 1989-90; to 98.5 percent in 1996-97, and continuing at that rate. Third-year residents expected to be 95 percent of first-year class, until mid-90's when it will increase to 95.5 percent and then to 95.6 percent. Graduates expected

to be 98 percent of third-year residents, increasing to 99 percent.

³ Estimates of attrition: 3 percent annually for 1987-91, 2.9 percent for 1992-94, 2.8 percent for 1995-97, 2.7 percent for 1998-2001, 2.6 percent for 2002-08, and 2.5 percent for 2009-10; this is estimated based on current retirement rates and ages of family physicians.

Table 9. Comparison of GMENAC and HMO utilization estimates of physician to population ratios

<i>Estimates</i>	<i>General and family practice GIM, ped., OB-GYN¹</i>		<i>All other specialties</i>		<i>Total</i>
	<i>Ratio</i>	<i>Percent</i>	<i>Ratio</i>	<i>Percent</i>	
GMENAC supply	1:1,040	44	1:808	56	1:455
GMENAC requirements	1:1,185	56	1:935	44	1:523
HMO utilization estimate ²	1:1,515	55	1:1,852	45	1:833
HMO utilization estimate ³	1:1,567	66	1:3,058	34	1:1,036
HMO utilization estimate ⁴	1:1,562	67	1:3,232	33	1:1,053

¹ GIM = general internal medicine, ped = pediatrics, OB = GYN = obstetrics-gynecology.² Reference 12.³ Reference 15.⁴ Reference 16.

NOTE: Adapted from final report of GMENAC, September 1980.

GMENAC requirements estimates. GMENAC's estimates of requirements were determined by using an adjusted needs-based model. GMENAC used disease-specific visit estimates and productivity adjusted for "realistic expectations for patient and provider care" to determine the needs for individual specialties. For estimating requirements, GMENAC essentially considered family physicians and internists equivalent for providing adult primary care and did estimations of requirements in an entirely intertwined fashion. GMENAC's model estimated the need for 521,431,344 visits by family, general, and osteopathic physicians and for 450,335,075 visits by general internists.

GMENAC expected the productivity of family physicians to fall, in keeping with the differences between general practitioners and residency-trained family physicians. The estimate of visits was based on a significant reduction in visits per week for family physicians, but not internists, from the statistics available when the study was done. GFP (general or family practitioners) were estimated to have 120 ambulatory care visits per week (5,520 per year) and GIM (general internal medicine) 80 visits per week, or 3,680 per year. This number compares to recent data on total visits (including hospital and other) to residency-trained physicians, which indicate that they average 129 patients per week (3); 140 per week (7); 132 per week (8); or 134 per week (9). The studies suggest that GMENAC estimated productivity fairly well.

GMENAC also estimated that the equivalent of about 13,183 full-time physicians would be available for adult primary care from other specialties, such as internal medicine subspecialties, pediatrics, and emergency medicine, or about 8 percent of the total. I am unaware of information on whether or not the specialist component providing primary care is increasing or decreasing.

Total requirements for all three of these other specialties for 1990 is 154,300 or 1 per 1,578. Adding pediatrics and obstetrics visits makes the total 208,550 or 1 per 1,188. Requirements for all other physicians would be 257,450 or 1 per 946. In other words, GMENAC estimated that family, general, or internal practitioners would be 33 percent of the total needs; adding pediatrics and obstetrics would make it 45 percent. Total physician requirements were 1 per 523.

Case Management Systems

Case management systems and Health Maintenance Organizations (HMOs) are an important

factor when considering the need for primary care physicians. In general, I use HMO as a rather inclusive term, covering case management systems which use case management and capitation for primary care. Dr. Alvin Tarlov has estimated that with continued growth in HMOs, the ratio for physicians in HMOs is about 106 per 100,000 enrolled population, while the remainder of the population would have a ratio of 334 per 100,000, about three times as many physicians (10). By December 1986, there were 626 HMOs nationally with an enrollment of 26 million people, a growth of 22 percent over 1985 (11). In 1981, there were only 10.5 million HMO members, so the enrollment has grown 2 1/2 times in 5 years.

In another publication, Tarlov (12) estimated that HMOs use 120 per 100,000, or 1 physician per 833 patients, equivalent to 60 percent greater than GMENAC requirement figures (table 9). About 55 percent of HMO physicians are internists, family physicians, pediatricians, and obstetrician-gynecologists (the equivalent of 66 per 100,000 or 1 physician per 1,515), about 28 percent higher than GMENAC's estimates of requirements. All other physicians would then be 54 per 100,000, or 1 physician per 1,852 patients, about 100 percent fewer than what GMENAC estimated would be required for other specialty physicians and about 130 percent fewer than the estimated supply.

Steinwachs and coworkers observed that some HMOs use substantially fewer primary care physicians than GMENAC estimated were needed (13). Of note, the number of physicians used by HMOs is extremely variable (14). The average for general physicians in nine HMOs was 0.4 per 1,000 enrollees (1 per 2,500) and about 0.3 per 100 enrollees for nonprimary care physicians (1 per 3,333). Overall, large HMOs averaged 1 physician per 1,000 for 1,052 enrollees (15). The authors of this study also found that the average for general practitioners and internists was 39.3 per 100,000; for pediatrics 15.0 per 100,000; obstetrics 9.5 per 100,000; all others 32.7 per 100,000—similar to Tarlov's figures for primary care but lower for specialty care. Coleman and Kaminsky concluded that there were more primary care physicians per 100,000 in HMOs than were available for the U.S. population. A study by Mason indicates the need for 1 family physician, pediatrician, obstetrician, or internist for every 1,562 HMO enrollees (16). The HMO figures would seem to indicate too many primary care physicians, and far, far too many specialists.

These HMO statistics have important implica-

tions for family medicine. HMOs often favor family physicians—they appear to be less expensive, order fewer tests, fewer consults, fewer hospitalizations, and see more patients (1); are better trained for the gate-keeping role HMOs like; and are better trained in outpatient medication, gynecology, dermatology, acute trauma, and psychosocial problems. Direct comparisons of the costs of care provided by general internists and family physicians in HMOs are scarce. One study (17) looked at one independent practice association (a form of HMO) to find which factors determined use of medical care by patients of different physicians. Burkett found that internists had a higher hospitalization rate than family physicians (560 days per 1,000 persons per year compared to 477 days per 1,000 persons per year), fewer primary care visits per year (1.88 per person compared to 2.91), more referrals, and greater referral expenditures (about 25 percent higher), although the average of the HMO patient was almost exactly the same. Bertakis and Robbins (18) randomized 520 patients to family practice or internal medicine residency training programs and found that after 2 years the internal medicine patients had more visits to nonprimary care clinics, higher laboratory charges, and more visits to the emergency room.

As a result of perceived cost-effectiveness and training for case management, HMOs are recruiting family physicians very heavily. Twenty-seven percent of residency graduate members of the American Academy of Family Physicians say they work for an HMO; 12 percent are involved with Independent Practice Associations and 16 percent with Preferred Provider Organizations.

These phenomena are a major part of what will happen to family practice in the next 10 years. Case management systems are expected to expand rapidly and, with them, the demand for family physicians.

Summary

GMENAC appeared to have projected the supply of family physicians accurately. Foreign medical graduates are unlikely to affect the future supply of family practice much, but if there is a marked decrease in FMGs entering the country, the supply of family physicians might decrease slightly. The increase in the number of women physicians is slower in family practice than in many specialties, but their numbers appear to be coming closer to the averages graduating from medical school. The biggest factor with potential to limit the supply of

family physicians is a reimbursement system which pays family physicians poorly compared to many other specialties, making it difficult to fund training programs and possibly leading to a declining interest in the field among graduating U.S. medical students.

The requirements for family physicians appear to be in greater flux than the supply. Primary care for the health needs of the population is extremely important and should be provided by those trained to provide primary care. Family physicians currently provide much of this primary care. The expansion of case management systems and health maintenance organizations, because of their need for good primary care case managers, has increased the demand for family physicians, a demand which will continue at least into the next decade. Family practice training programs are not keeping up with the demand for family physicians.

Probably the one change that would help to improve the supply to meet the requirements would be to increase the income of family physicians relative to those of other specialties. Meantime, the sources of funding for family practice residencies should continue and perhaps be expanded.

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Analysis of Fatal Pedestrian Injuries in King County, WA, and Prospects for Prevention

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Synopsis

Pedestrian fatalities caused by motor vehicles in King County, WA, over a 12-month period were

reviewed to examine the potential for prevention by various strategies. Cases were identified through the King County Medical Examiner's Office. Between April 1, 1985, and March 31, 1986, a total of 38 pedestrians died of motor vehicle injuries. The victims were generally children (N=11), the elderly (N=13), or intoxicated adults (N=9). Supervision of the child was inadequate in 64 percent of the children's deaths. The driver was at fault in deaths of seven children, five adults, and three elderly persons. None of the children and only one of the elderly victims was injured at night. The majority of injuries occurred on major thoroughfares; only 16 percent occurred on residential streets.

Possible strategies for prevention appear to include improved enforcement of pedestrian right-of-way laws, changes in vehicle design, modification of the environment (particularly in urban areas), and improved training programs for children.

AS DEATHS FROM OTHER causes have decreased dramatically over the past 50 years due to improving social conditions and more effective medical care, injuries have become the most important cause of death during the first half of the human lifespan (1). In the injury field, most attention has appropriately been given to reducing the toll of death and disability for the occupants of motor vehicles. The problem of pedestrians struck by motor vehicles, however, has received relatively little attention.

Approximately 8,000 persons a year are killed as

pedestrians, making it the second largest category of motor vehicle deaths (2). Pedestrian deaths comprise about one-sixth of all traffic related deaths, half of the traffic deaths of children, and one-third of those among the elderly. Among children, pedestrian injury is the third leading cause among deaths attributable to unintentional injury and the leading cause of deaths from trauma among 5 to 9-year-olds (3).

Prevention of many other types of injuries has been successfully approached on a national or State level. For example, motor vehicle occupant injuries